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ABSTRACT

The purpose of this study was to complete a job analysis of the Air Force's Medical Service Career Field. This is the first in a series of reports designed to compare and make recommendations concerning the role of the Nurse and Medical Corpsman in the Air Force's health care delivery system. A sample of 1,996 airmen in the Medical Service Career Field was used for the analysis. The data were analyzed by use of the Comprehensive Occupational Data Analysis Programs (CODAP). Meaningful job types were identified, and recommendations for changing the structure of the Medical Service Career Ladder were made based on the occupational analysis. (Included are diagrams of major clusters and job types and two appendixes of statistics on task performance and task differences.) (Author/BP)

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AIR FORCE HUMAN RESOURCES LABORATORY

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JOB ANALYSIS OF THE MEDICAL SERVICE CAREER FIELD

By

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This technical report has been reviewed and approved.

RAYMOND E. CHRISTAL, Chief
Occupational Research Division

Approved for publication.

HAROLD E. FISCHER, Colonel, USAF
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The purpose of this study was to complete a job analysis of the Air Force's Medical service Career Field. This is the first in a series of reports designed to compare and make recommendations concerning the role of the Nurse and Medical Corpsman in the Air Force's health care delivery system. A sample of 1,996 airmen in the Medical Service Career Field (AFSC 902X0, 90292) was used for the analysis. The data were analyzed by use of the Comprehensive Occupational Data Analysis Programs (CODAP). Meaningful job types were identified and recommendations for changing the structure of the Medical Service Career Ladder were made based on the occupational analysis.

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Consolidated descriptions of job type groups, together with other pertinent printout data, are available to qualified requesters on a loan basis from the Air Force Human Resources Laboratory's Occupational Research Division/PEOA, Lackland AFB, Texas 78236.

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JOB ANALYSIS OF THE MEDICAL SERVICE CAREER FIELD

I. INTRODUCTION

This study is part of a comprehensive experimental program developed in cooperation with the Nursing Resources Study Group appointed by the Air Force Surgeon General. The Nursing Resources Study Group was interested in the survey as a source of quantitative, Air Force-wide information on Air Force nurse and medical service specialties for use in determining current and future Air Force nurse requirements. This report is the first of a series of reports designed to analyze the commonality of tasks performed by Air Force nursing and medical service personnel. The purpose of this report was to describe the occupational analysis of a sample of 1,996 airmen in the medical Service Career Field and to place their jobs into meaningful job types. Reports describing the job analysis of nursing personnel are currently in various stages of completion. The final report of this series will consist of a comprehensive comparison of tasks performed by Air Force nursing and medical service personnel with emphasis on possible recommendations for management in regard to delineation of duties and responsibilities within the current structure of the Air Force health care delivery systems.

Definition of Utilization Field

The Medical Service Utilization Field includes the Medical Service Specialist, AFSC 90230/50, the Medical Service Technician, AFSC 90270, and the Medical Service Superintendent, AFSC 90292. According to AFM 39-1, the Medical Service Specialist "Performs technical nursing duties involved in the care and treatment of patients; assists with patient movements by air evacuation and ambulance; and assists with nonflying physical examinations." The 7- and 9-skill level descriptions require administrative and supervisory experience and assign greater responsibility for independent duty. The Medical Service Specialist is required to interact and coordinate with patients, physicians, and nurses to provide a comprehensive, high-quality patient care service.

Definition of Occupational Analysis

The Air Force method of occupational analysis makes use of Air Force-wide job surveys for the collection of quantitative data directly from job incumbents who describe their job within the specialty area. In completing the job survey, each incumbent supplies identification and background data and checks those tasks which are part of his present job. He then rates the tasks he checked on a 7-point scale, indicating the relative amount of time spent on each task compared to all other tasks performed. The ratings range from 1 (very much below average) to 7 (very much above average) with 4 being a mid-point (about average).

The techniques for conducting occupational surveys and analysis are reported in a series of research reports dating back to 1958. Past research and continuing experience with survey data derived from the job task inventory indicate that this technique produces highly reliable information about existing Air Force jobs.

Air Force occupational surveys are authorized under AFM 35-2, *Occupational Analysis*, and are part of the Air Force Personnel Testing Program. The computer analysis system, Comprehensive Occupational Data Analysis Programs (CODAP), developed for use in the analysis of occupational survey data consists of almost 50,000 program instructions and is fully documented only in technical systems manuals.

The Job Inventory

The job inventory was constructed using the general procedures described by Morsh and Archer (1967). The inventory consisted of 600 task statements grouped under 11 duty headings. Of the 600 tasks, 575 tasks were identical or equivalent to task statements used in the Nurse Utilization Field Job Inventory, AFPT 80-97XX-011. The other 25 tasks were unique to the Medical Service Utilization Field and not performed by nurses. The biographical information included in the survey was kept as similar as possible to the Nurse Utilization Field Inventory.

The job inventory was administered in accordance with AFM 35-2 at each Air Force base and approximately 2,800 completed survey booklets were returned for analysis. From the 2,800 returns, 1,996 cases were randomly selected for inclusion in the job-type analysis. The 1,996 sample size was used because of existing sample size restrictions in the present computing capability of the CODAP system on the IBM 7040 computer. Distributions of cases selected by Command, Duty AFSC, and Grade are included in Tables 1, 2, and 3.

II. IDENTIFICATION OF JOB TYPES

As a first step in the analysis, the computer converts each individual's relative time-spent responses (1-7 scale) to percent time ratings. To obtain the percent time ratings, all of an incumbent's time-spent ratings are summed and the total is assumed to represent 100 percent of his time spent on the job. Each rating is divided by the total and the quotient multiplied by 100 to give a percent time spent estimate on each task. For the purpose of organizing jobs into similar units of work, an automated job-clustering computer program was used. This hierarchical-grouping program (Christal & Ward, 1967) is the basic part of the CODAP system for job analysis. The computer compares each individual with every other individual in the sample in terms of percent time spent on each and every task in the inventory. The computer locates the two persons with the most similar jobs and combines them to form a group with a composite job description. In successive stages, the program adds other members to this group or forms new groups based on similarity in the percent of time spent on tasks description. This procedure is continued until all individuals and groups are combined to form a single group. At each stage of the grouping process an index of homogeneity is calculated. This index, percentage of work overlap of group members, is explained by Archer (1966). The index is an estimate of the overlap of work that would be expected if a member of the group was randomly reassigned to a job in that same group.

A diagram of the results of the hierarchical grouping procedures are included in Figure 1. Each group is identified by a group number indicating the stage in the program during which the group was formed, the overlap value, and number of subjects in the group. For example, GRP 001 was formed at group stage 1, the last stage of the grouping program. The overlap at this stage is 0.3 percent. There are 1,996 individuals in the group. Since it is the last stage, this is equivalent to the total sample.

For those designated groups, the raw data from both the background information and task listing were converted into a form more readily interpretable for identifying job types. Reports obtained included background variables with descriptive statistics for quantifiable data and lists of tasks with percent members performing, and average percent time values for each task. Extracts from the task list report for GRP 001 appear in Table 4. Additional reports, identifying the differences in those tasks performed by the major job types and the identification of the primary tasks performed by each job type, are included in Appendix A and B.

III. RESULTS

Table 5 presents data for each of the major clusters and subclusters from the task inventory, including the number of members in each group, and the number of tasks representing 25, 50, and 100 percent of total group work time.

In spite of the wide variance in number of tasks appearing in the different percentages of the job, it is interesting to note that no group claimed to perform all of the tasks in the inventory. By comparing the data indicating the number of tasks that represent a given percent of time for the total job, it is clear that GRP's 123, 268, and 55 have the more heterogeneous duties. That is, they perform a much wider variety of tasks than any of the other groups represented.

Table 6 presents data from the background section of the survey for the major clusters and subclusters, including grade, percent assigned in CONUS, average education level, average number of pieces of equipment the incumbent is familiar with, job interest and felt utilization of talents and training. The administrative cluster (GRP 55), as expected, had an extremely high grade structure. Less expected was the high average grade of those individuals assigned to the air evacuation squadrons. The lowest average grade for a group is the OB ward cluster, who also show lesser values of job interest and felt-utilization of talents and training. The emergency services group falls in about the mid-range of the groups in grade structure, but report the most job interest and felt utilization. In contrast members of the central sterile supply group, who also fall in the mid-range of grades, have the lowest values for job interest and felt utilization. Note that there is no significant difference between the average education level of any of these groups.

Brief summary descriptions are presented for each of the major clusters and subclusters, in order from left to right in Figure 1. Each job cluster is identified by both the group number and its respective title.

Emergency Services - Outpatient GRP 123

As indicated in Table 6, members of this group reported a great deal of job interest and feel well utilized in their career field. They perform a

relative wide range of tasks and are familiar with a wide assortment of equipment. The cluster is divided into three subclusters, as indicated in Figure 1. These subclusters represent individuals assigned to the emergency room and ambulance section, to outpatient clinics, and supervisors of these two groups. Listed as follows are representative tasks performed by the emergency service cluster:

Apply bandages

Change dressings

Administer first-aid

Take and record blood pressures

Answer telephone calls for or from patients or hospital staff members

Clean and maintain equipment

Remove sutures

Take and record pulses, temperatures and respirations

Suture lacerations

Administer intramuscular medications

Approximately 90 percent of the cluster perform each of these tasks and these 10 tasks represent over 10 percent of the time spent by the entire cluster. To summarize the job of the emergency service cluster, they are the first line of health care. They see the patient when he first arrives for treatment. The tasks these specialists perform require a great deal of responsible, professional health care. It is probably because of this responsibility that the emergency service cluster does show such a high degree of job interest and felt utilization of talent and training.

Ward Services Cluster - Inpatient GRP 268

As indicated in Table 5, this group performs a wider variety of tasks than any other group. The average grade is only 3.4, which is in the lower range of all groups. From Figure 1 it can be seen that the ward services cluster is broken into two subclusters; the general ward corpsman and the special ward corpsman. The special ward corpsman is usually identified with one single specialty ward, such as pediatrics, psychiatry, air evacuation staging squadron, or surgery, while the general corpsman was usually assigned to a general medicine ward. Listed as follows are representative tasks performed by the ward services cluster:

Take and record pulses, temperatures and respirations

Take and record blood pressures

Collect food trays or serving units

Make beds

Administer bedpans or urinals

Clean patient care unit

Clean ward utility room

Collect and label specimens such as urine, feces, or sputum from patients

Clean and maintain equipment

Measure and record intake and output

An average 94 percent of all members in the ward services cluster perform each of these tasks. The tasks listed account for just over 9 percent of the total percent time represented by the entire cluster. To summarize the duties of the ward services personnel, they monitor progress of inpatients, provide custodial care for these patients, and perform most of the janitorial duties on the ward.

In the comments section of the job survey many individuals who were assigned as ward corpsmen commented that they were not given enough responsibility and spent too much time performing janitorial duties. This probably accounts for the ratings obtained for the felt utilization and job interest for this group.

OB Ward-Inpatient - GRP 64

The OB ward subcluster, as indicated in Table 6, had the lowest average grade of any of the major clusters or subclusters. They also fell into the lower range on the job interest and felt utilization scales. Their job descriptions indicate that their jobs are a great deal more homogeneous than either the Emergency Service Group or the Ward Services Group. (See Table 5, average number of tasks performed and the number of tasks that account for 25 percent of their time spent) A partial list of representative tasks performed by this subcluster includes:

Take and record pulses, temperatures and respirations

Take and record blood pressures

Collect food trays or serving units

Clean patient care unit

Make beds

Clean ward utility room

Clean and maintain equipment

Fold or count linen

Perform general housekeeping duties

Answer telephone calls for or from patients or hospital staff members.

These taks represent over 18 percent of the total time spent by this group with an average of approximately 78 percent of the members performing each of these tasks. Note the great similarity between these tasks and those listed for the Ward services group. The primary difference between the two groups is that the OB Ward subcluster spends more time performing janitorial tasks and a few specialized tasks common only to the care of female patients and the delivery of babies. The comments section from members of the OB ward subcluster was very similar to that reported for the ward services. The medical service specialists assigned to the OB Ward desire more responsibility and interaction with the patient than they are currently afforded.

Administrative Services Cluster - Inpatient GRP 55

The members of the Administrative Services Cluster feel well utilized and are interested in their jobs (Table 6). They perform a wide range of tasks and are familiar with a wide variety of equipment. Most of this can be accounted for by the higher average grade of this cluster, which indicates more experience and a greater career commitment. Most of the members of this group are in at least their second enlistment and many are in their third, fourth, or fifth enlistment. As can be seen in Figure 1, the cluster consists of two subclusters. One cluster consists of individuals who are assigned to the nursing services section of the hospital, the other is the ward supervisors or NCOICs. The vast majority of the time spent by this group is in monitoring and supervising the performance of other Medical Service Specialists or performing hospital administrative functions. They have little direct patient contact. A representative list of tasks performed are listed as follows:

Answers telephone calls for or from patients or hospital staff members.

Supervise 902X0 or 90 X2 personnel

Determine work priorities

Counsel personnel on personal problems

Counsel personnel on performance evaluations or standards

Direct or supervise utilization of equipment and supplies

Evaluate performance of Medical Service personnel

Coordinate work activities with other sections

Develop or improve work methods or procedures

Direct or supervise housekeeping activities

These tasks represent over 10 percent of the time spent by this group, with an average of 83 percent of all members in the group performing each of these tasks.

Unlike the supervisor subcluster identified in the emergency service group, these supervisors do not provide any health care directly to the patient. Their jobs consist primarily of clerical and administrative types of tasks.

Air Evacuation - GRP 151

This was a relatively small subcluster of senior NCOs who may be misclassified and would be more accurately assigned with AFSC 901X0, Aeromedical Specialist. These individuals apparently do fly with the Aeromedical Evacuation Squadrons. A list of representative taks performed by this subcluster includes:

Perform preflight check of patient care area on aeromedical aircraft

Enplane or deplane patients during aeromedical evacuation

Serve inflight meals

Prepare aircraft to receive patients

Supervise enplaning or deplaning patients

Prepare medical supplies or equipment for aeromedical evacuation

Supervise the onloading, securing, or offloading of aeromedical supplies or equipment

Secure medical equipment prior to take-off

Supervise preparation of aircraft to receive patients

Plan or provide nursing care in flight.

Each of these tasks is performed by 100 percent of the group members and the tasks represent 21 percent of the total time spent by the entire group.

Other Patient Services - GRP 21

This group consists of three rather heterogeneous subclusters. Note in Figure 1 that the overlap for the cluster is only 13 percent which is significantly smaller than any of the other major

clusters. Two of the clusters, physical examination and allergy and immunization, are clearly outpatient job types while the third, reception, is performed in both outpatient and inpatient job types. Reception includes admitting clerks, for hospitals as well as receptionist at outpatient clinics. The physical examination and allergy and immunizations subclusters can be generally classified as well-patient clinic functions. There is no single set of representative tasks that can describe the entire cluster. Note from Table 6 that job interest and felt utilization of this group is in the lower range of the clusters listed. This most likely is due to the highly repetitive nature of the tasks performed by this group. This hypothesis is further supported by Table 5 which shows that just 38 tasks comprise 50 percent of the total time spent by the cluster. This is especially impressive when you consider the diversity of job types included in this cluster.

Central Sterile Supply - GRP 13

This is a small subcluster whose primary tasks consist of sterilizing instruments, and maintaining adequate equipment and supplies for the wards. They have little or no patient contact. They perform only a few tasks that account for most of their time and do not feel well utilized nor show much job interest. Representative tasks for this group include:

Prepare items for sterilization

Sterilize instruments

Sterilize supplies

Operate distillation equipment

These four tasks represent more than 20 percent of the total time spent by the group; each is performed by an average of 80 percent of the members. Excluding those tasks related to sterilization activities, the tasks performed by this group more closely resemble the job of a Medical Material Specialist (AFSC 915X0) than the Medical Service Specialist. Because of the smaller number of individuals in this group and the lack of commonality of the tasks performed, excluding the three sterilization tasks, it is impossible to make any conclusive recommendations about this job cluster.

IV. DISCUSSION

Nearly all of the major clusters presented in Figure 1 could be clearly dichotomized on the basis of the type of patient receiving the care (*i.e.*, inpatient or outpatient). The outpatient clusters include GRP 123, Emergency Services, and most of GRP 21, Other Patient Services. Their role in health care is to provide either emergency services (suturing lacerations, applying casts), or maintenance care (giving physical exams and giving allergy and immunization shots). The inpatient clusters include GRP 268, Ward Services, GRP 64, OB Ward, GRP 55, Administrative Services, and a small segment of GRP 21, Other Patient Services. The role of the inpatient care groups appears to be two-fold; first, they monitor the recovery of patients and second, they are responsible for much of the hospital administration.

The differences between tasks performed by the inpatient groups *versus* the outpatient groups is very clear and dramatic. Representative differences between GRP 123 (Outpatient) and GRP 268 (Inpatient) are presented in Appendix B. These two groups represent 60 percent of the total sample and are most representative of the technical (non-administrative) tasks performed by first-term (78 percent of these groups are first-term airmen).

Having observed the noticeable differences in tasks performed by the Medical Service Specialist assigned to Inpatient Services *versus* Outpatient Services, it is necessary to consider the impact of dividing the medical service career field into two shredouts, one for outpatient and one for inpatient.

First, consider the impact on patient care. Because the tasks performed in the Medical Service Career Field are technical in nature, the individual assigned to the Inpatient Services for one tour and then to Outpatient Services is faced with having to relearn many skills he has lost since technical school training and, in addition, he must learn *new* procedures developed since his original schooling. Because of the rapid development in the area of the health services, a second process is also taking place when the individual switches from one of these groups to the other. His previously learned skills are becoming obsolete. This technical obsolescence means that, if required to return to the job of his original assignment, he will not only have to relearn many skills that naturally perish from disuse but also learn totally new technical skills and procedures. This continuous learning and relearning cycle means the patient is not receiving the same quality level of services that could be provided if the Medical Services Career Ladder were divided into outpatient and inpatient shredouts.

It is also expected that providing inpatient-outpatient shredouts for the Medical Service Career Ladder would produce more job interest and felt utilization by members of this career field.

The airmen would have more job stability across assignments, yet each shredout would still possess sufficient variability to allow the individual to perform a wide range of tasks. The most common comment made by Medical Service personnel surveyed related to the dissatisfaction of being reassigned to either outpatient or inpatient service after having completed a tour in the other. Their consensus was that cross service reassignment was a waste of talent and experience, and it appears to be the major irritant within the career field. By creating separate shredouts this irritant should be either eliminated or significantly reduced.

Other frequently stated comments were: (*a*) the Medical Services Specialist is not given enough responsibility for inpatient care, and (*b*) they were frequently delegated janitorial tasks with little opportunity to interact with either patients or professional medical personnel. Thus, they were not afforded the opportunity to learn on the job nor perform the tasks they were trained to perform. The first complaint, while worthy of note, may alleviate itself with the advent of an all volunteer medical force. If there is a reduction in the number of professional medical personnel, the enlisted, technical personnel would be the natural group to take up the slack. From the present survey it appears that they are more than willing to accept any additional responsibility and are eager to learn new tasks to improve patient care. The complaint of being relegated to janitorial tasks might well be alleviated by increased civilianization of janitorial services. This must be considered if the Medical Service Specialist is expected to accept a greater role in the Air Force health care system. The clustering and identification of job types for the Medical Service Utilization Field was highly successful using the Nurses Job Inventory. Using the same inventory for related enlisted and officer career fields will allow a combined analysis of both fields. This is expected to permit a useful differentiation of jobs and indicate any commonality of tasks performed by the groups. This type of information should provide a significant impact in defining appropriate areas of responsibility, efficient manpower utilization procedures, and improved satisfaction and retention of both officers and NCOs in the Medical Service and Nursing career fields. More research is being accomplished in directly comparing the officer and enlisted jobs, and these dual comparative analyses will be reported in succeeding reports.

Table 1. **Distribution of Sample Across Major Air Commands**

MC	N	MC	N	MC	N
AAD	27	AFSC	104	PACAF	109
ADC	50	ATC	295	SAC	470
AFCS	15	AU	43	TAC	324
AFLC	75	HQ COMD	50	USAFA	1
AFRES	2	HQ USAF	13	USAFE	117
		MAC	247	USAFSO	9
				UNKNOWN	45

Table 2. **Distribution of Duty AFSC's For Total Sample**

AFSC	N
90230	417
90250	1,259
90270	274
92092	32

Table 3. **Grade Distribution of Total Sample**

Grade	N
E1	2
E2	100
E3	862
E4	448
E5	293
E6	140
E7	68
E8	20
E9	2

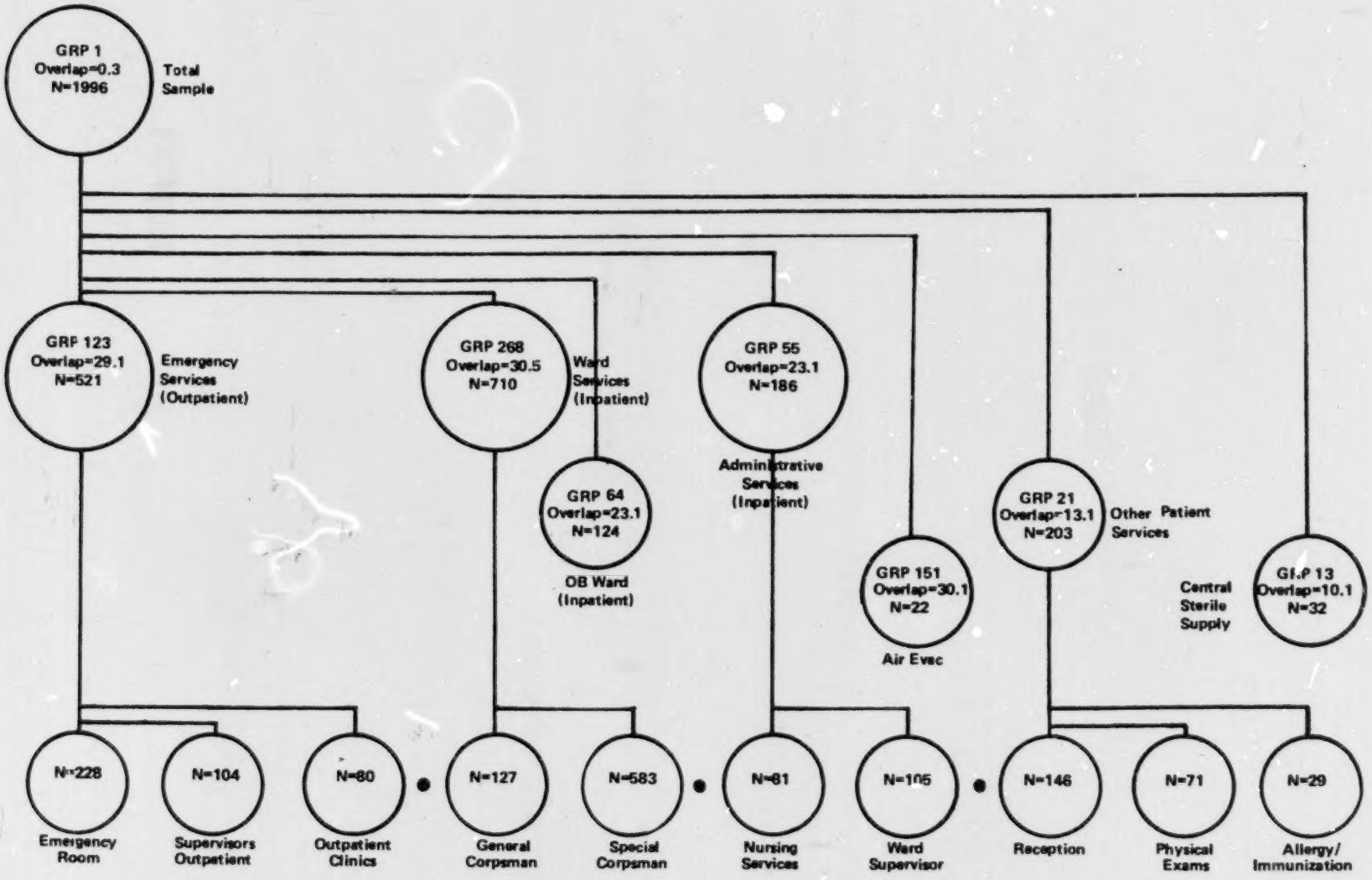

Fig. 1. Diagram of Major Clusters and Job Types

Table 4. **Task Description For GRP 1-Total Sample**

D-TSK	DUTY/TASK TITLE	CUMULATIVE SUM OF AVERAGE PERCENT TIME SPENT BY ALL MEMBERS.....	AVE AMT PERCENT TIME SPENT BY ALL MEMBERS.....	AVERAGE PERCENT TIME SPENT BY MEMBERS PERFORMING.....	PERCENT OF MEMBERS PERFORMING.....	TASK SEQ NO
A 2	ANSWER TELEPHONE CALLS FOR OR FROM PATIENTS OR HOSPITAL STAFF MEMBERS (2)	63.62	1.53	1.28	1.28	
B 151	TAKE AND RECORD BLOOD PRESSURES (332)	65.12	1.49	1.24	2.52	
B 182	TAKE AND RECORD PULSES, TEMPERATURES AND RESPIRATIONS (331)	66.82	1.39	1.16	3.67	
B 71	CLEAN AND MAINTAIN EQUIPMENT (220)	75.05	1.26	0.90	4.56	
B 133	PERFORM GENERAL HOUSEKEEPING DUTIES (282)	67.38	1.32	0.87	5.45	5
A 66	LABEL SPECIMENS AND FILL OUT LABORATORY SPECIMEN REQUEST FORMS (66)	71.27	1.21	0.86	6.31	
A 101	PREPARE CONSULTATION REQUESTS OR LAB SLIPS (131)	66.13	1.26	0.85	7.16	
B 16	ADMINISTER INTRAMUSCULAR MEDICATIONS (165)	70.73	1.02	0.72	7.88	
B 35	APPLY BANDAGES (184)	70.19	1.06	0.72	8.59	
B 88	FOLD OR COUNT LINEN (237)	63.98	1.08	0.69	9.28	10
B 72	CHANGE DRESSINGS (214)	67.28	1.00	0.67	9.95	
B 77	COLLECT AND LABEL SPECIMENS SUCH AS URINE, FECES OR SPUTUM FROM PATIENTS (226)	65.53	1.01	0.66	10.61	
E 63	TAKE ELECTROCARDIOGRAPH (EKG) TRACINGS (463)	59.82	1.11	0.66	11.28	
A 6	ASSIST PATIENTS IN PLACING TELEPHONE CALLS (6)	66.93	0.99	0.60	11.88	
B 74	CLEAN PATIENT CARE UNIT (223)	63.76	1.13	0.59	12.47	15
A 65	INVENTORY SUPPLIES (65)	56.16	1.09	0.59	13.06	
A 18	COORDINATE WITH PHYSICIAN REGARDING PATIENT CARE (18)	57.01	1.03	0.59	13.65	
B 73	CLEAN MINOR SURGERY OR EXAMINATION ROOMS (222)	54.01	1.08	0.58	14.24	
B 153	PREPARE PATIENTS FOR PHYSICIAN EXAMINATION OR TREATMENT (304)	57.06	0.99	0.56	14.80	
B 176	SET UP OR USE OXYGEN EQUIPMENT (325)	67.99	0.82	0.56	15.36	20
B 12	ADMINISTER FIRST AID (161)	61.62	0.91	0.56	15.92	
B 25	ADMINISTER ORAL MEDICATIONS (174)	64.48	0.86	0.56	16.47	
B 104	MAKE BEDS OTHER THAN POSTOPERATIVE OR RECOVERY (253)	54.16	1.02	0.55	17.03	
A 59	INITIATE REQUESTS TO CENTRAL STERILE SUPPLY (59)	57.72	0.94	0.54	17.57	
B 76	CLEAN WARD UTILITY ROOM (225)	53.63	1.06	0.54	18.11	25
E 62	TAKE CULTURES TO DETERMINE THE EXISTENCE OF DISEASE-PRODUCING ORGANISMS (459)	54.06	0.98	0.53	18.64	
B 177	SET UP OR USE SUCTION EQUIPMENT (326)	66.23	0.79	0.53	19.16	
B 78	COLLECT FOOD TRAYS OR SERVING UNITS (227)	48.53	1.08	0.52	19.69	
A 29	COORDINATE WITH WARDMASTER (NCOIC) REGARDING PATIENT CARE (29)	52.51	0.98	0.52	20.20	
A 81	ORIENT NEW PATIENTS TO HOSPITAL RULES AND FACILITIES (81)	53.96	0.93	0.51	20.71	30
B 3	ADMINISTER BED PANS OR URINALS (152)	54.96	0.99	0.50	21.21	
B 27	ADMINISTER SUBCUTANEOUS MEDICATIONS (176)	57.06	0.85	0.48	21.69	
B 195	TRANSPORT PATIENTS ON LITTERS (339)	56.77	0.82	0.48	22.17	
B 81	DISPOSE OF CONTAMINATED MATERIALS (230)	59.87	0.88	0.48	22.65	

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Table 5. **Descriptive Task Data for Major Clusters and Subclusters**

Group Number	Number of Members	Average Number Of Tasks Performed	Number of Tasks Performed A Given Percent of Time		
			25%	50%	100%
GRP 123	521	134.58	29	74	596
GRP 268	710	154.14	32	79	598
GRP 64	124	58.58	15	41	427
GRP 55	186	100.15	28	72	564
GRP 151	22	82.82	13	34	322
GRP 21	203	34.96	13	38	483
GRP 13	32	29.13	6	18	285

Table 6. **Descriptive Background Data for Major Clusters and Subclusters**

Group Number	Average Grade	Average Equipment With Which Familiar	Average Education Level	Job Interest (1-7 Scale)	Felt Utilization (1-7 Scale)	Percent Assigned CONUS
GRP 123	4.2	26.6	12.8	5.35	4.03	76
GRP 268	3.4	26.2	12.6	5.07	3.56	88
GRP 64	3.0	17.3	12.7	4.80	3.04	85
GRP 55	5.5	33.5	12.7	5.10	3.99	87
GRP 151	5.6	27.5	12.2	5.27	3.82	55
GRP 21	3.9	21.8	12.6	4.74	3.18	85
GRP 13	4.0	22.3	12.6	4.23	2.86	94

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Christal, R.E., & Ward, J.H., Jr. The MAXOF clustering model. In M. Lorr & S.B. Lyerly (Eds.), *Proceedings of the conference on cluster analysis of multivariate data.* New Orleans, La.: Catholic University of America, June 1967, 11.02-11.45.

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PRIMARY JOB TYPE IDENTIFIERS SELECTED BY PERCENT OF MEMBERS PERFORMING

PRIJOB MAJOR CLUSTERS

DY-TSK	DESCRIPTION	GRP123 GRP268	GRP064	GRP151 GRP055	GRP021	GRP013
A 2	ANSWER TELEPHONE CALLS FOR OR FROM PATIENTS OR HOSPITAL STAFF MEMBERS (2)	85	90	79	88	32	76	31
A 6	ASSIST PATIENTS IN PLACING TELEPHONE CALLS (6)	62	89	61	53	14	27	13
A 21	COORDINATE WORK ACTIVITIES WITH OTHER SECTIONS (21)	45	32	3	81	59	38	38
A 23	COUNSEL PERSONNEL ON PERSONAL PROBLEMS (23)	29	27	2	88	36	15	13
A 24	COUNSEL PERSONNEL ON PERFORMANCE EVALUATIONS OR STANDARDS (24)	30	22	2	87	36	14	9
A 29	DETERMINE WORK PRIORITIES (29)	43	38	13	83	41	25	31
A 30	DEVELOP OR IMPROVE WORK METHODS OR PROCEDURES (30)	50	46	16	84	50	38	25
A 35	DIRECT OR SUPERVISE THE UTILIZATION OF EQUIPMENT AND SUPPLIES (35)	41	36	6	83	32	21	31
A 42	EVALUATE DUTY PERFORMANCE OF MEDICAL SERVICE PERSONNEL (42)	29	21	3	81	41	13	6
A 66	LABEL SPECIMENS AND FILL OUT LABORATORY SPECIMEN REQUEST FORMS (66)	83	89	56	57	5	57	16
A 81	ORIENT NEW PATIENTS TO HOSPITAL RULES AND FACILITIES (81)	24	92	51	40	5	12	0
A 82	ORIENT VISITORS TO WARD (82)	12	84	52	3	0	1	3
A 101	PREPARE CONSULTATION REQUESTS OR LAB SLIPS (101)	83	66	31	53	5	75	6
B 3	ADMINISTER BED PANS OR URINALS (152)	33	95	53	20	68	2	0
B 6	ADMINISTER COMPLETE BED BATHS (155)	9	88	27	11	23	1	0
B 7	ADMINISTER EAR DROPS (156)	81	64	10	19	45	14	3
B 8	ADMINISTER EAR IRRIGATIONS (157)	89	50	6	16	18	20	3
B 9	ADMINISTER ENEMAS (158)	46	85	23	16	14	5	0
B 10	ADMINISTER EYE DROPS (159)	87	75	29	25	45	15	3
B 11	ADMINISTER EYE IRRIGATIONS (160)	87	53	16	18	27	11	0
B 12	ADMINISTER FIRST AID (161)	93	65	15	31	50	30	13
B 16	ADMINISTER INTRAMUSCULAR MEDICATIONS (165)	92	83	48	37	55	36	6
B 19	ADMINISTER IPPB (INTERMITTANT POSITIVE PRESSURE BREATHING) THERAPY (168)	51	88	34	26	5	3	3
B 25	ADMINISTER ORAL MEDICATIONS (174)	77	87	26	29	68	20	0
B 26	ADMINISTER PARTIAL BED BATHS (175)	15	89	28	11	23	3	0
B 27	ADMINISTER SUBCUTANEOUS MEDICATIONS (176)	84	65	13	22	36	25	3
B 32	ADMINISTER WOUND IRRIGATIONS (181)	85	65	7	15	18	5	3
B 33	AMBULATE PATIENTS (182)	35	94	39	13	55	3	0
B 35	APPLY BANDAGES (184)	94	88	26	31	50	28	6
B 41	APPLY COLD - ICE CAP OR COMPRESSES (190)	72	89	25	16	27	6	0
B 43	APPLY HEAT BY CRADLE, HOT WATER BOTTLE OR COMPRESSES (192)	38	84	22	15	27	2	0
B 45	APPLY HEAT BY K-PAD OR CHEMICAL HEATING PAD (194)	19	92	35	20	41	1	3
B 49	APPLY SPLINTS (198)	84	28	2	11	9	10	6
B 50	ARRANGE FURNITURE IN PATIENT'S ROOM (199)	6	82	47	21	5	1	0
B 56	ASSIST PATIENTS TO TURN, COUGH AND DEEP BREATHE (215)	15	92	28	15	41	1	3
B 70	CHANGE DRESSINGS (219)	93	87	21	20	50	20	3
B 71	CLEAN AND MAINTAIN EQUIPMENT (220)	90	91	72	38	55	34	47
B 73	CLEAN MINOR SURGERY OR EXAMINATION ROOMS (222)	80	57	42	17	6	27	13
B 74	CLEAN PATIENT CARE UNIT (223)	24	92	81	28	3	8	3
B 76	CLEAN WARD UTILITY ROOM (225)	15	94	74	26	3	2	6
B 77	COLLECT AND LABEL SPECIMENS SUCH AS URINE, FECES OR SPUTUM FROM PATIENTS (226)	67	95	65	29	5	16	0
B 78	COLLECT FOOD TRAYS OR SERVING UNITS (227)	5	95	85	20	36	1	0
B 81	DISPOSE OF CONTAMINATED MATERIALS (231)	56	87	60	29	27	14	25

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B	84	ESCORT PATIENTS ON AMBULANCE RUNS (233)	82	58	2[illegible]	18	[illegible]	20	13
B	87	FEED INCAPACITATED PATIENTS (236)	7	92	27	10	68	1	0
B	88	FOLD OR COUNT LINEN (237)	64	85	73	34	[illegible]	27	38
B	9[illegible]	GIVE BACK RUBS (239)	1[illegible]	82	23	7	36	1	[illegible]
B	99	INSTRUCT PATIENTS IN CRUTCH WALKING (248)	82	41	2	8	5	5	3
B	104	MAKE BEDS OTHER THAN POSTOPERATIVE OR RECOVERY (253)	27	94	77	25	23	3	3
B	106	MAKE POSTOPERATIVE OR RECOVERY BEDS (255)	5	86	52	17	[illegible]	0	3
B	112	MEASURE AND RECORD INTAKE AND OUTPUT (261)	12	93	57	20	45	1	0
B	119	OBSERVE AND REPORT CHANGES IN CONDITION OF PATIENTS (268)	45	84	49	26	36	7	6
B	122	ORGANIZE OR RESTOCK INTRAVENOUS CART OR TRAY (271)	60	81	41	21	5	1	13
B	133	PERFORM GENERAL HOUSEKEEPING DUTIES (282)	74	85	60	38	45	36	19
B	134	PERFORM ISOLATION OR REVERSE ISOLATION TECHNIQUE (283)	13	84	36	17	50	2	6
B	135	PERFORM ORAL HYGIENE (284)	12	82	9	9	36	1	[illegible]
B	138	PERFORM POSTOPERATIVE CARE (287)	13	83	26	17	[illegible]	1	[illegible]
B	148	PERFORM URINE TEST FOR SUGAR, ACETONE OR ALBUMIN (297)	5[illegible]	88	4[illegible]	20	36	11	0
B	168	SERVE BETWEEN-MEAL NOURISHMENT TO PATIENTS (317)	2	85	45	1[illegible]	59	0	[illegible]
B	169	SERVE PRESCRIBED DIETS TO PATIENTS (318)	2	85	49	16	55	0	0
B	176	SET UP OR USE OXYGEN EQUIPMENT (325)	61	91	58	32	73	8	31
B	177	SET UP OR USE SUCTION EQUIPMENT (326)	8	89	55	28	73	6	34
B	181	TAKE AND RECORD BLOOD PRESSURES (330)	96	97	89	50	82	78	16
B	182	TAKE AND RECORD PULSES, TEMPERATURES AND RESPIRATIONS (331)	9[illegible]	97	94	48	77	67	16
E	13	DEBRIDE WOUNDS (41)	83	26	[illegible]	1[illegible]	[illegible]	6	3
E	62	TAKE CULTURES TO DETERMINE THE EXISTENCE OF DISEASE-PRODUCING ORGANISMS (459)	84	53	27	31	[illegible]	32	6
E	63	TAKE ELECTROCARDIOGRAPH (EKG) TRACINGS (46)	83	66	16	28	14	44	13
F	8	PREPARE ITEMS FOR STERILIZATION (473)	41	34	58	19	9	5	91
F	9	STERILIZE INSTRUMENTS (474)	32	23	52	15	9	5	84
F	1[illegible]	STERILIZE SUPPLIES (475)	26	21	51	14	9	3	84
G	22	REMOVE SUTURES (497)	92	49	6	16	5	19	9
G	27	SUTURE LACERATIONS (502)	88	15	1	8	5	7	9
J	5	COORDINATE WITH FLIGHT CREW CONCERNING SUCH ITEMS AS FLIGHT PLAN OR MISSION REQUIREMENTS (552)	2	2	1	1	86	[illegible]	[illegible]
J	7	ENPLANE OR DEPLANE PATIENTS DURING AEROMEDICAL EVACUATION (554)	29	19	5	5	10[illegible]	3	9
J	9	ONLOAD OR OFFLOAD BAGGAGE DURING AEROMEDICAL EVACUATION (556)	21	15	2	2	1[illegible]	3	6
J	10	OPERATE INFLIGHT EMERGENCY OXYGEN SYSTEMS (557)	2	1	[illegible]	1	95	[illegible]	3
J	11	PERFORM PREFLIGHT CHECK OF PATIENT CARE AREA ON AEROMEDICAL AIRCRAFT (558)	1	1	[illegible]	[illegible]	1[illegible]	[illegible]	3
J	12	PLAN OR PROVIDE NURSING CARE IN FLIGHT (559)	1	1	[illegible]	1	1[illegible]	[illegible]	3
J	13	PREPARE AIRCRAFT TO RECEIVE PATIENTS (560)	1	1	[illegible]	[illegible]	10[illegible]	[illegible]	3
J	14	PREPARE AND GIVE PREFLIGHT BRIEFING TO MEDICAL CREW (561)	1	1	[illegible]	1	86	[illegible]	0
J	15	PREPARE MEDICAL SUPPLIES OR EQUIPMENT FOR AEROMEDICAL EVACUATION (562)	5	6	[illegible]	1	10[illegible]	[illegible]	6
J	16	PREPARE OR GIVE PREFLIGHT AND INFLIGHT BRIEFINGS TO PATIENTS (563)	1	4	[illegible]	1	91	[illegible]	[illegible]
J	22	SECURE MEDICAL EQUIPMENT PRIOR TO TAKE-OFF (569)	2	2	[illegible]	1	1[illegible]	1	3
J	23	SERVE INFLIGHT MEALS (570)	[illegible]	1	1	[illegible]	10[illegible]	1	3
J	24	SUPERVISE AIRCRAFT SANITATION (571)	0	0	1	[illegible]	82	1	0

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APPENDIX B. TASK DIFFERENCE DESCRIPTION BETWEEN GROUPS 132 and 268

DIFFERENCE BETWEEN GRP123 AND GRP268 — 081072 PAGE 1

GROUP DIFFERENCE MED SVC 9C2X0
GRP123 MEMBERS = 521 KPATH ORDER FROM 1 TO 521 GROUP STAGE = 123
GRP268 MEMBERS = 710 KPATH ORDER FROM 522 TO 1231 GROUP STAGE = 268

D-TSK	TASK TITLE	PERCENT MEMBERS PERFORMING---DIFFERENCE, GRP123 MINUS GRP268	GRP268 PERCENT MEMBERS PERFORMING	GRP123 PERCENT MEMBERS PERFORMING
G 27	SUTURE LACERATIONS (502)	89.48	14.51	73.98
G 24	PREPARE EMERGENCY REPORTS SUCH AS INJURY, ANIMAL BITE OR POISONING REPORTS (495)	76.79	9.15	67.62
D 4	ADMINISTER LOCAL ANESTHESIA (381)	72.74	8.31	64.43
E 61	SUGGEST OR ORDER LABORATORY OR X-RAY PROCEDURES FOR PATIENTS (458)	76.97	15.21	61.76
G 25	SCREEN OUTPATIENTS TO DETERMINE THEIR CLASSIFICATION OR PRIORITY OF TREATMENT (500)	64.68	4.65	60.04
B 37	APPLY CASTS TO THE EXTREMITIES (186)	73.70	16.20	57.51
E 13	DEBRIDE WOUNDS (410)	82.92	25.77	57.14
B 44	APPLY SPLINTS (198)	84.26	28.45	55.81
E 68	WRITE PRESCRIPTIONS FOR PHYSICIAN SIGNATURE (465)	70.25	15.21	55.04
E 17	DRIVE MILITARY VEHICLES IN PERFORMING MEDICAL DUTIES (414)	73.72	18.87	54.83
E 18	IDENTIFY AND MANAGE BURNS (415)	79.65	25.49	54.16
G 18	PERFORM MINOR SURGERY (493)	58.93	5.37	53.85
G 2	ADMINISTER IMMUNIZATIONS (477)	71.98	23.66	48.31
B 164	REMOVE PLASTER CASTS (313)	69.87	22.96	46.91
A 107	PREPARE OR MAINTAIN OUTPATIENT RECORDS (107)	68.52	23.24	45.28
E 65	TIE OFF OR CLAMP BLEEDERS (462)	51.25	7.46	43.78
G 22	REMOVE SUTURES (497)	92.13	49.01	43.12
E 20	IDENTIFY AND MANAGE FRACTURES OR DISLOCATIONS (417)	60.46	19.01	41.45
B 99	INSTRUCT PATIENTS IN CRUTCH WALKING (248)	81.96	41.13	40.83
B 173	SET UP INSTRUMENTS FOR MINOR SURGERY (322)	78.89	38.17	40.72
D 6	EXPLAIN ANESTHETIC PROCEDURE TO PATIENT (383)	52.02	11.69	40.33
B 8	ADMINISTER EAR IRRIGATIONS (157)	88.87	50.14	38.73
E 54	PRESCRIBE TREATMENTS (451)	42.42	4.08	38.33
A 109	PREPARE OR SUBMIT REPORTS OF TREATMENT (109)	57.97	21.27	36.70
B 96	INITIATE REQUESTS FOR DRUGS FROM PHARMACY (245)	56.81	20.42	36.39
B 2	ACCOUNT FOR NARCOTICS OR CONTROLLED DRUGS (151)	45.11	9.30	35.81
B 158	PREPARE PRESCRIBED MEDICATIONS (307)	62.57	27.46	35.11
G 13	DETERMINE IMMUNIZATION REQUIREMENTS (488)	39.92	5.07	34.85
D 20	WRITE DRUG ORDERS AS PRESCRIBED BY PHYSICIAN AND OBTAIN HIS SIGNATURE (397)	44.53	10.00	34.53
B 11	ADMINISTER EYE IRRIGATIONS (160)	87.14	52.96	34.18
G 28	SUTURE SURGICAL INCISIONS (503)	37.62	3.94	33.68
A 33	DIRECT OR SUPERVISE THE ADMINISTRATION OF DRUGS (33)	48.37	15.35	33.02
E 64	TAKE X-RAYS (461)	37.62	4.93	32.69
A 78	NOTIFY PHYSICIANS OF PATIENT ARRIVALS AND STATUS (78)	70.44	38.45	31.99
E 33	OBTAIN MEDICAL HISTORY FROM PATIENT OR OTHER INFORMANT (430)	54.32	22.68	31.64
E 21	IDENTIFY AND MANAGE SUNSTROKE OR HEAT EXHAUSTION (418)	44.53	13.24	31.29
E 19	IDENTIFY AND MANAGE COLD INJURIES (416)	43.76	12.82	30.95
E 62	TAKE CULTURES TO DETERMINE THE EXISTENCE OF DISEASE-PRODUCING ORGANISMS (459)	83.88	53.10	30.78
B 121	OBTAIN PATIENT OR FAMILY CONSENT FOR TREATMENT (272)	65.83	35.49	30.34
B 130	PERFORM EXTERNAL CARDIAC MASSAGE (279)	63.72	34.37	29.36
E 16	DIAGNOSE PATIENT ILLNESS (413)	32.63	3.80	28.83
B 12	ADMINISTER FIRST AID (161)	93.47	65.07	28.40
E 59	SET UP EQUIPMENT FOR USE IN CARDIAC EMERGENCIES (456)	63.92	35.63	28.28
D 5	DETERMINE TYPE OF ANESTHETIC AGENT TO BE USED (382)	32.05	3.94	28.11
B 129	PERFORM DRUG INVENTORY (278)	37.04	9.21	28.83
B 98	INSERT ORAL AIRWAY (247)	63.15	35.35	27.80
E 11	CONDUCT SICK CALL IN ABSENCE OF PHYSICIAN (408)	28.41	2.68	25.73
E 53	PRESCRIBE MEDICATIONS (450)	27.26	1.69	25.57
B 69	GIVE ARTIFICIAL RESPIRATION (238)	68.91	43.94	24.96
B 22	ADMINISTER NARCOTICS (171)	61.23	36.34	24.89

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	B 5	ADMINISTER COLOSTOMY IRRIGATIONS (154)	8.45	46.48	-38.03
	B 148	PERFORM URINE TEST FOR SUGAR, ACETONE OR ALBUMIN (297)	49.71	88.03	-38.32
	B 9	ADMINISTER ENEMAS (158)	45.87	85.07	-39.20
	B 119	OBSERVE AND REPORT CHANGES IN CONDITION OF PATIENTS (269)	44.72	83.94	-39.22
	A 144	SUPERVISE THE SERVING OF FOOD TO PATIENTS (144)	1.92	42.11	-40.19
	A 106	PREPARE OR MAINTAIN INPATIENT RECORDS (106)	10.94	51.41	-40.47
	B 154	PREPARE PATIENTS FOR AEROMEDICAL EVACUATION (303)	24.76	66.06	-41.30
	B 92	IDENTIFY OR CARE FOR POSTOPERATIVE HEMORRHAGE (241)	11.32	52.96	-41.63
	B 111	MAKE WARD ROUNDS WITH PHYSICIANS (260)	5.76	48.45	-42.69
	B 150	PREPARE AND MAINTAIN NURSING CARE PLANS (299)	2.88	48.31	-45.43
	B 55	ASSIST PATIENT WITH POSTURAL DRAINAGE (204)	9.98	55.63	-45.65
	A 103	PREPARE INPATIENT I.D. BANDS (OTHER THAN INFANT) (103)	9.21	55.21	-46.00
	B 43	APPLY HEAT BY CRADLE, HOT WATER BOTTLE OR COMPRESSES (192)	37.81	83.94	-46.13
	B 170	SET UP AND REGULATE CROUPETTE (319)	5.18	52.54	-47.35
	A 117	RECEIVE AND DELIVER MAIL, MESSAGES OR PERSONAL ITEMS FOR PATIENTS (117)	9.98	60.42	-50.44
	A 74	MEET WITH NURSES TO PLAN FOR TOTAL PATIENT CARE (74)	12.48	63.10	-50.62
	B 142	PERFORM TERMINAL DISINFECTION PROCEDURES (291)	15.36	66.90	-51.55
	B 109	MAKE WARD ROUNDS ALONE (258)	3.45	57.61	-54.15
	B 105	MAKE ENTRIES IN WARD CARDEXES (254)	3.84	59.86	-56.02
	B 91	GIVE COMPREHENSIVE SKIN CARE (240)	10.94	68.31	-57.37
	B 139	PERFORM PREOPERATIVE CARE (288)	18.62	76.20	-57.58
	A 79	ORDER OR COORDINATE PATIENT DIETS WITH FOOD SERVICE (79)	4.22	63.24	-59.02
	B 44	APPLY HEAT BY ELECTRICAL HEATING PAD OR THERMAL BLANKET (193)	18.23	77.61	-59.37
	B 33	AMBULATE PATIENTS (182)	34.74	94.23	-59.48
	A 11	CHECK MASTER DIET LIST AGAINST PHYSICIANS' ORDERS (11)	6.53	66.62	-60.09
	B 168	TEACH PATIENTS ABOUT POSTOPERATIVE RECOVERY PROCEDURES SUCH AS EXTREMITY MOVEMENTS, DEEP BREATHING OR COUGHING (337)	8.64	69.01	-60.38
	B 3	ADMINISTER BED PANS OR URINALS (152)	33.01	94.65	-61.63
	B 104	MAKE BEDS OTHER THAN POSTOPERATIVE OR RECOVERY (253)	27.45	94.08	-66.64
	B 74	CLEAN PATIENT CARE UNIT (223)	24.38	91.97	-67.60
	A 81	ORIENT NEW PATIENTS TO HOSPITAL RULES AND FACILITIES (81)	24.18	92.25	-68.07
	B 75	CLEAN WARD KITCHEN (224)	5.76	74.79	-69.03
	B 138	PERFORM POSTOPERATIVE CARE (287)	13.24	82.82	-69.57
	B 135	PERFORM ORAL HYGIENE (284)	11.90	81.97	-70.07
	B 110	MAKE WARD ROUNDS WITH WARD NURSES, SUPERVISOR OR CHIEF NURSE (259)	3.84	74.65	-70.81
	B 134	PERFORM ISOLATION OR REVERSE ISOLATION TECHNIQUE (283)	13.24	84.08	-70.84
	A 82	ORIENT VISITORS TO WARD (82)	12.48	83.52	-71.05
	B 90	GIVE BACK RUBS (239)	10.36	81.83	-71.47
	B 45	APPLY HEAT BY K-PAD OR CHEMICAL HEATING PAD (194)	19.00	91.55	-72.55
	B 175	SET UP ISOLATION UNITS (324)	5.57	79.15	-73.59
	B 26	ADMINISTER PARTIAL BED BATHS (175)	14.59	89.15	-74.57
	B 87	FEED INCAPACITATED PATIENTS (236)	7.29	82.39	-75.10
	B 53	ARRANGE FURNITURE IN PATIENT'S ROOM (199)	6.14	82.39	-76.25
	B 56	ASSIST PATIENTS TO TURN, COUGH AND DEEP BREATHE (205)	15.36	92.25	-76.90
	B 6	ADMINISTER COMPLETE BED BATHS (155)	9.21	87.75	-78.53
	B 76	CLEAN WARD UTILITY ROOM (225)	14.59	93.94	-79.36
	B 106	MAKE POSTOPERATIVE OR RECOVERY BEDS (255)	5.37	86.20	-80.82
	B 112	MEASURE AND RECORD INTAKE AND OUTPUT (261)	11.71	92.96	-81.25
	B 168	SERVE BETWEEN-MEAL NOURISHMENT TO PATIENTS (317)	2.30	85.07	-82.77
	B 169	SERVE PRESCRIBED DIETS TO PATIENTS (318)	1.92	84.79	-82.87
	B 78	COLLECT FOOD TRAYS OR SERVING UNITS (227)	4.80	94.79	-89.99

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